CLAIMS

What is claimed:

1. An acousto-optic tunable filter comprising:

an optical fiber having an interaction length;

a wave generator coupled to the optical fiber and generating an acoustic wave in the optical fiber; and

a damper located on the optical fiber with the interaction length between the wave generator and the damper, the damper having a first surface which, as viewed in cross-section through the damper and the fiber at right angles to a direction in which the fiber extends, covers a portion only of the optical fiber.

2. The acousto-optic filter of claim 1 wherein the acoustic wave is the flexural wave.

3. The acousto-optic filter of claim 2 wherein the flexural wave has an amplitude in a y-direction and the first surface is at an acute angle relative to the y-direction.

4. The acousto-optic filter of claim 1 wherein the first surface is on a side of the damper facing the transducer.

5. The acousto-optic filter of claim 4 wherein the damper has a second surface on a side thereof opposing the transducer which is slanted.

6. The acousto-optic filter of claim 5 wherein the second surface relative to the direction of travel of the wave is obtuse and acute on the first and second sides of the fiber, respectively.

7. The acousto-optic filter of claim 6 wherein reflections of the flexural wave by the first and second surfaces respectively at least partially cancel one another out.

8. The acousto-optic filter of claim 1 wherein the damper is made of at least one of silicone and a porous material.

9. The acousto-optic filter of claim 1 wherein the mount has a groove and the fiber is located longitudinally in the groove, the damper being deposited over the fiber within the groove and being longer, as measured in the direction in which the wave travels in a base of the groove, than above the fiber.

10. The acousto-optic filter of claim 1 wherein light couples from one optical

mode to another in the fiber.

11. The acousto-optic filter of claim 10 wherein the interaction length has a core through which the light travels and a cladding into which the light couples due to the wave.

12. The acousto-optic filter of claim 11 wherein the damper has a refractive index substantially close to the refractive index of a layer of the cladding.

13. The acousto-optic filter of claim 10 wherein the surface has a varying slope.

14. The acousto-optic filter of claim 13 wherein the surface, relative to a direction in which the optical fiber extends, is at a smaller angle next to the optical fiber than above and below the optical fiber.

15. An acousto-optic filter comprising:

an optical fiber having an interaction length;

a wave generator coupled to the fiber and generating an acoustic wave in the optical fiber; and

one or more dampers defining a plurality of surfaces transverse to a direction in which the acoustic wave travels, reflections of the acoustic wave by

the surfaces back towards the wave generator at least partially canceling one another out.

16. The acousto-optic filter of claim 15 wherein the acoustic wave is the flexural wave.

17. The acousto-optic filter of claim 15 wherein the surfaces are first and second surfaces of a first damper respectively facing toward and away from the transducer.

18. The acousto-optic filter of claim 17 wherein a third of the surfaces is on a second damper and faces towards the second surface.

19. The acousto-optic filter of claim 15 wherein at least a first of the surfaces is at an oblique angle relative to the direction in which the wave travels.

20. The acousto-optic filter of claim 19 wherein at least a second of the surfaces is at an oblique angle relative to the direction in which the flexural wave travels.

21. A method of filtering light comprising:

transmitting the light through an optical fiber;

vibrating a first end of an interaction length of the fiber to generate an acoustic wave traveling through the interaction length; and

damping the transverse wave with a damper at a second, opposing end of the interaction length, the damper having a first surface which is slanted so that the damper covers a portion only of the optical fiber as viewed in cross-section through the damper and the fiber at right angles to a direction in which the fiber extends.

22. A method of filtering light comprising:

transmitting the light through an optical fiber;

vibrating a first end of an interaction length of the fiber to generate an acoustic wave traveling through the interaction length;

reflecting a first portion of the wave with a first location at a second, opposing end of the interaction length, back towards the first end; and

reflecting a second portion of the wave at a second location, on a side of the first surface opposing the first end, back toward the first end, the portions of the wave reflected from the first and second locations at least partially canceling one another out.